Letters to the Editor

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The Persistence of a High Maternal Mortality Rate in the Ivory Coast

Maternal mortality is a public health priority in developing countries, especially in Africa, as shown by the health statistics of the Maternal Health Division of World Health Organization.[1,2] In the referral hospitals of Abidjan, Ivory Coast, the rate was 3279 per 100 000 hospital births in 1979, and 1681 in 1986. These hospitals admit the majority of obstetric emergencies from surrounding areas.[3]

To assess the trends in maternal mortality, we retrospectively studied all births and maternal deaths between 1989 and 1992 in the referral hospitals (Cocody, Treichville, and Yopougon) and in governmental and nongovernmental primary maternity facilities in Abidjan. During the study period, a large new referral maternity was opened in Abidjan.

Using diagnostic codes from the 9th revision of the *International Classification of Diseases,* we recorded the total number and the causes of maternal deaths, the reasons for admission in cases of obstetric transfer, and the duration of hospitalization.[4] Our findings are as follows:

- The number of births decreased slightly from 92 049 in 1989 to 91 277 in 1990, 90 448 in 1991, and 87 389 in 1992. During the study period, the number of home births remained relatively stable, at around a third of all deliveries in the Abidjan area. The numbers of maternal deaths were 257 in 1989, 268 in 1990, 236 in 1991, and 234 in 1992. The maternal mortality rate for all Abidjan medical facilities (approximately 70% of deliveries) has remained stable over the last 4 years despite expanded facilities.
- Around 80% of all maternal deaths were a result of abortion, ruptured uterus, sepsis, and postpartum hemorrhage. A striking 70% of deaths followed induced home abortions (abortion is illegal in the Ivory Coast), and for half of these women, the first pregnancy was fatal.
- Among the women whose deaths were not associated with abortion, two thirds were women transferred from local maternity facilities. Half of these women died within 6 hours of admission to the referral hospital, and two thirds within 24 hours, which was not expected in such an urban area where transfers are easy and relatively fast.[5]

There were frequent inconsistencies between diagnoses established by local maternities (before transfers) and those established at the referral hospitals. This suggests that the women often were in a critical condition before being transferred, and that there is serious delay and incapacity in primary maternity facilities.

In conclusion, this study in a large capital city in West Africa shows the stability of the maternal mortality rate from 1989 to 1992, despite expanded facilities, the high prevalence of induced abortion (which continues to be the major cause of maternal death), and the lack of appropriate obstetric management in the primary maternity facilities. □

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Lead Poisoning among US Hispanic Children

In their article on lead poisoning in Massachusetts, Sargent et al. stated that "There have been few epidemiological studies of lead poisoning in Hispanic children."[1] The authors did not cite any studies of lead levels among Hispanic children. Lead data have been published for Mexican-American, Cuban, and Puerto Rican children from the Hispanic Health and Nutrition Examination Survey (HHANES),[2–4] and Mexican-American children from the third National Health and Nutrition Examination Survey (NHANES).[5,6] Both HHANES and NHANES III suggest that Hispanics have an elevated risk of lead poisoning. Screening program results also demonstrate a higher rate of elevated blood lead among Hispanics.[7]

During the period of 1982 to 1984, 4.9% of 4- to 5-year-old Mexican-American children in the Southwest, and 10.6% of 4- to 5-year-old Puerto Rican children in the New York City metropolitan area were found to have lead levels at least 25 ug/dl—higher than those for non-Hispanic Whites during the period of 1976 to 1980.[2] These findings are relevant to the Massachusetts study because 52.6% of Hispanics in Massachusetts are Puerto Rican. More recently, NHANES III found that 1% of 1- to 2-year-old Mexican-American children had lead levels of at least 25 ug/dl during the period of 1989 to 1991, compared with 0.4% of non-Hispanic Whites and 1.4% among non-Hispanic Blacks.[5] The trends for 3- to 5-year-olds were similar (0.7%, 0.4%, and 0.8%, respectively).

A similar pattern was seen in the case identification rates and the odds ratios, given by Sargent et al., by percentages of the population who were Hispanic or Black (Table 2).[1] When race and Hispanic ethnicity were included as separate variables in the logistic model, the relationship between the percentage Hispanic and lead poisoning among newborn to 4-year-olds became statistically insignificant at the .05 level. We have concerns about the use of race and ethnicity separately for two reasons. First, the terms "race" and "ethnicity" frequently are used interchangeably in the United States. In most daily and practical applications, Hispanics are considered a "race." Second, the overlap of Blacks and Hispanics (e.g., Black Hispanics) could be highest in the areas with nonzero case identification rates (larger, nonrural communities). For example, 16% of Boston's Hispanic population is Black, compared with 8.9% of Massachusetts' Hispanic population.

Although the decennial census uses two separate questions to collect race and ethnicity data, the data can be analyzed in a combined format using the categories non-Hispanic White, non-Hispanic Black, and Hispanic. It would be interesting to see whether the percentage Hispanic would have been statistically significant using this constructed variable. □

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Note. The views expressed here are the authors' and do not necessarily reflect the official position of the Office of Minority Health or the Bureau of the Census.

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Sargent and Colleagues Respond

We appreciate the letter from Carter-Pokras and Harrison, which provides an accurate summary of current knowledge of the epidemiology of lead exposure among Hispanic children; we would like to note that we did not cite 1994 papers on National Health and Nutrition Examination Survey (NHANES) III data because we drafted our manuscript in 1992.

The authors ask an important question about lead exposure among racial subgroups of ethnically Hispanic children. Carter-Pokras and Harrison suggest using 1990 census data on race in Hispanics to construct different independent variables. In response to their request, we first subtracted persons who identified themselves as "Black Hispanic" from the numerator of the "percent population black" variable. The new variable, percent non-Hispanic Black, was highly correlated with the old variable ($r = 0.993$). Consequently, substitution of "percent non-Hispanic Black" for "percent population Black" in the original model had no appreciable effect on the magnitude or significance of the odds ratio for this variable (OR = 1.04 for the old and the new variables). In addition, "percent population Hispanic" continues to be insignificant at the .05 level when added to this new model.

Carter-Pokras and Harrison also suggest constructing three Hispanic variables: "White Hispanic," "Black Hispanic," and "other Hispanic." We constructed two variables, "percent population Black Hispanic" and "percent population non-Black Hispanic." We chose only two categories because we hypothesize that children of African heritage may be at higher risk for lead exposure for biological reasons; thus, we are primarily interested in determining if communities with Hispanics of African heritage show higher risk of lead poisoning after controlling for effects of poor housing and poverty. We know of no evidence that factors other than poverty and poor housing affect risk of lead exposure in the other Hispanic racial subgroups. Table 1 (on the next page) shows the model resulting from inclusion of these two variables.

This model suggests that the odds for lead poisoning in a community increases by an average of 1.44 for each 1% increase in the Hispanic Black population and